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06/19/2006

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EXAMINER

NGUYEN, TUAN N

ART UNIT

PAPER NUMBER

2828

DATE MAILED: 06/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

DETAILED ACTION

Response to Amendment

1. In respond to applicant's amendment filed 03/14/2006, claims 1, 2, 4, 5, 7, 8, 11, 12, 14, 15, have been amended. Claim 3 has been canceled, and claims 21-24 have been added. Claims 1,2, 4-24 are pending.
2. Applicant's arguments with respect to claims 1, 2, 4-24 have been considered but are moot in view of old ground(s) of rejection.

Claim Rejections - 35 USC § 102

3. The following is a quotation of 35 U.S.C. 102(b) which forms the basis for all obviousness rejections set forth in this Office action:

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
4. Claims 1-12, 15, 19-20, 23-24 are rejected under 35 U.S.C. 102(a) as being unpatentable over Paschotta (WO 01/59895)

With respect to claim 1 Paschotta (WO 01/59895) discloses a laser device for generating laser pulses (*Fig 1: 21, 1, 10 semiconductor device generating laser pulses 10, 10'; Fig 7: 2*) with an optically pumped semiconductor laser (*Fig 1,7: 7*) (*Page 12: 5-15 diode pumping laser*), comprising:

an external resonator (*Fig 7, 8: 12 external resonator*)(*Page 11: 10-24 first reflective and second reflective element 11, 12, "active mirror element"*),

and at least one mode-locker (*Fig 1, 7: 5*)(*Page 11: 15-20 SESAM semiconductor saturable absorber mirror*)(*Title: Passively mode-lock optically pumped semiconductor external-cavity laser*) (*Page 3: 10-20, passive mode locking technique relies on saturable absorber mechanism*), and

a first pump radiation source which is monolithically integrated into the semiconductor laser and arranged to optically pump the semiconductor laser (*Page 11: 15-22*)(*Fig 1: 3 quantum well/active layer the first pump source monolithically integrated into the semiconductor laser*)(*ABSTRACT*).

With respect to claim 2, (*Fig 1, 7: 7*) shows wherein the semiconductor laser is optically pumped by means of a pump radiation source arranged *externally* (*Fig 1, 7: pump radiation source 70 into the semiconductor surface 21*).

With respect to claims 4, 5, 6 Paschotta (WO 01/59895) discloses and shows and at least one mode-locker that is passive mode-locker and is a saturable absorber (*Fig 1, 7: 5*)(*Page 11: 15-20 SESAM semiconductor saturable absorber mirror*)(*Title: Passively mode-lock optically pumped semiconductor external-cavity laser*) (*Page 3: 10-20, passive mode locking technique relies on saturable absorber mechanism*),

With respect to claim 7 Paschotta (WO 01/59895) discloses the mode-locker is monolithically integrated into the semiconductor laser (*Page 11: 19-22 the bragg reflector part of the semiconductor made of semiconductor and locking a desired wavelengths*) (*Page 5: 5-10*

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passively mode –locked incorporated into the semiconductor structure; page 7: 5-10 – passive mode-locked based on ion-doped crystal ; Page 13).

With respect to claim 8, Paschotta (WO 01/59895) discloses the mode-locker (10) is combined with a resonator mirror (9) (Page 13: 22-26: SESAM 5 consists of Bragg mirrors) (Page 17: Table 1 “Resonant structure 5- Low/Hi index made of AlAs & AlGaAs).

With respect to claims 9, 10 Paschotta (WO 01/59895) discloses wherein the resonator has a device for phase compensation, and arranged downstream of the resonator (Page 3: 10-20- passive mode locking use to stabilize short pulse)(Page 9: 1-3 – where suitable spectral filter in laser cavity or placing saturable absorber at a place in the cavity, for phase of wavelength compensation).

With respect to claims 11, 12 Paschotta (WO 01/59895) discloses the use of the optical fiber in the phase compensation (*Page 12: 7-8 light deliver through optic fiber*), and the folding mirror (*Col 12: 18 the folding mirror 8*).

With respect to claim 15 Paschotta (WO 01/59895) discloses the laser pulses have a pulse duration which is less than 100 ps (*Page 12: 23 pulse of 26ps*)(*Page 14: 19 – 25.7ps*)

With respect to claims 19, 20 Paschotta (WO 01/59895) shows the mode-locker is arranged in said external resonator, or arranged internally and part is arranged externally of the

semiconductor laser. *(Fig 1: 5, 12, 8, 4)(Fig 7: 4,5,12) (Fig 8,9: 12,5, mode locker and resonator mirror, Bragg, and output lens/resonator).*

With respect to claim 23 Paschotta (WO 01/59895) discloses a laser device for generating laser pulses *(Fig 1: 21, 1, 10 semiconductor device generating laser pulses 10, 10'; Fig 7: 2)* with an optically pumped semiconductor laser *(Fig 1,7: 7) (Page 12: 5-15 diode pumping laser),* comprising:

an external resonator *(Fig 7, 8: 12 external resonator)(Page 11: 10-24 first reflective and second reflective element 11, 12, "active mirror element"),*

and at least one mode-locker *(Fig 1,7: 5)(Page 11: 15-20 SESAM semiconductor saturable absorber mirror)(Title: Passively mode-lock optically pumped semiconductor external-cavity laser) (Page 3: 10-20, passive mode locking technique relies on saturable absorber mechanism),*

wherein the resonator has a device for phase compensation *(ABSTRACT)(Page 11: 15-22 phase compensation saturable absorber mirror SESAM 5 and/or Bragg reflector).*

With respect to claim 24 Paschotta (WO 01/59895) discloses the device for phase compensation is integrated into the semiconductor laser *(Page 11: 19-22 the bragg reflector part of the semiconductor made of semiconductor and locking a desired wavelengths) (Page 5: 5-10 passively mode -locked incorporated into the semiconductor structure; page 7: 5-10 - passive mode-locked based on ion-doped crystal ; Page 13).*

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5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or non-obviousness.

6. Claims 13, 14, 16, 18, 21-22 are rejected under 35 U.S.C. 102(a) as being unpatentable over Paschotta (WO 01/59895).

With respect to claims 13,14 (Fig 1, 7) shows the resonator has a first resonator branch for generating laser pulses having a wavelength, and a second resonator branch for generating laser pulses having a second wavelength (*Fig 1: 1st wavelength input 70, 1st lasing pulse from semiconductor 10, 2nd wavelength after enter and exit SESAM absorber mirror 12, 5*), and the pulses are coupled to one another in a phase-locked manner (*Fig 7: 10, 12 mode-lock to output coupler mirror*).

With respect to claims 16-18, the claims further require that the laser is a laser oscillator, amplifier, or CPA amplifier. Paschotta did not discretely disclose the laser type, however it has been held to be within one skill in the art to select known part for its suitability for the intended

use involves only routine skill in the art, in this case the type of laser use would have been obvious as this would not have changed the structure and operation of optical pump laser device with mode locker.

With respect to claims 21, 22, the claims further require that the laser pulse duration is less than 20ps and 1ps. Paschotta (WO 01/59895) discloses the laser pulses have a pulse duration around 19-25.7ps (*Page 12: 23 pulse of 26ps*)(*Page 14: 19 – 25.7ps*). It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum ranges involves only routine skill in the art.

Response to Argument

7. Applicant's arguments filed on 03/14/2006 have been fully considered but they are not persuasive.

Page 7, Applicant pointed out “there is no suggestion or motivation in Paschotta to integrate a pump radiation source with a semiconductor laser”; the Examiner stands that since the semiconductor has quantum-well/active layer therefore it is inherent that the semiconductor laser has a pump radiation source; in addition, Paschotta use external pump source to optically pump the laser.

Page 8, Applicant pointed out a heat dissipation problem exist in semiconductor, therefore there is no suggestion or motivation to monolithically integrate the radiation source with the semiconductor laser. The Examiner stands that since semiconductor has quantum-well/active layer therefore integrate pump radiation source does exist within the inside the integrate structure, whether there is heat dissipation problem exist or not.

Page 9, Applicant pointed out the new independent and dependent claims 23, 24 that the reference does not teach a device for phase compensation. Please see rejection of claims 23, 24.

Pages 9-10, Applicant further pointed out the reference felt to teach “*passive shutter is fast enough, ultra short pulses can be shaped and stabilized*” “*saturable absorber mechanism shape and utilize ultra short pulses*”, “*reference discuss wherein several pulses instead of a single pulse can be circulated with a fixed spacing*”, “*using elements to compensate for group velocity dispersion*”, and “*compensate for different phase velocities of spectral fractions of a wave package, thus reducing group velocity dispersion*”. **The examiner read the claims given their broadest reasonable interpretation consistent with the specification. However, it is not proper to read limitations appearing in the specification into the claim when these limitations are not recited in the claim(s).**

Conclusion

8. Applicant’s amendment necessitated the old ground(s) of rejection presented in this office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP 706.07. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

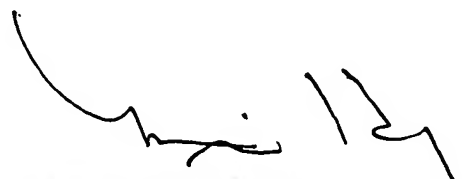
Communication Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan N Nguyen whose telephone number is (571) 272-1948. The examiner can normally be reached on M-F: 7:30 - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harvey Minsun can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tuan N. Nguyen



MINSUN CH HARVEY
PRIMARY EXAMINER